

**Overlap Between Nearctic and Neotropical Faunae
of Tabanidae in Western North America**
(Diptera)

CORNELIUS B. PHILIP

*National Institutes of Health, Pub. Health Serv.,
U. S. Dept. H. E. W., Hamilton, Montana*

Among insects, Diptera are some of the most widely dispersed and successful colonizers and Tabanidae are good representatives of the strong fliers. Oldroyd (1954) propounded a theory that tabanids radiated into both southern and northern hemispheres from progenitors which originated in South America and he cites evidence based on the African fauna to support this novel idea. Even if so, this does not necessarily explain why primitive elements of this family in North America have moved less strongly into the temperate and boreal areas than have the more specialized chrysopines and tabanines.

There has not been systematic or intensive collecting of tabanids in the predominantly arid regions on either side of the western political United States–Mexican border, typified by the Sonoran Desert (Shreve, 1951) or Sonoran Biotic Province (Dice, 1943). However, available data indicate that there has been penetration and movement southward as well as northward by these flies in modern times. Western parts of Merriam's Lower Sonoran Zone also coincide but the tabanid fauna in the eastern extension of this zone is of only incidental interest in the present discussion. The relative paucity of tabanid collections in the expansive arid areas of southwestern U.S.A. and northwestern Mexico probably also relates in part to stringencies of breeding of these mostly semi-aquatic insects.

The available distributional records of the indigenous tabanid fauna reinforce observations that the frequent southern geographic limitation of the Nearctic fauna to the area north of the political boundary of Mexico is arbitrary and one more of convenience than of biological reality. Nevertheless, there is no practical, comprehensive zoogeographic substitute for these two regional concepts.

The tabanid fauna indigenous to the area discussed below comprises 3 genera of the phylogenetically primitive subfamily Pangoniinae, namely, *Apatolestes*, *Esenbeckia*, and *Pilimas*; 2 of the more specialized Chrysopinae—*Silvius* and *Chrysops*; and 5 of the higher Tabaninae—*Bolbodimyia*, *Stenotabanus*, *Leucotabanus*, *Hybomitra*, and *Tabanus*. It seems not unlikely that a sixth tabanine genus, *Haematopota* (H.

americana Osten Sacken extends from Alaska to New Mexico), will be found extending southward along mountain chains into northern Mexico.

The number of species (only 21 plus infraspecific forms) that have been actually recorded on both sides of the political border west from New Mexico and the State of Chihuahua is relatively small (Philip, 1965).

These are *Apatolestes aitkeni* Philip, *Esenbeckia delta* Hine, and *E. incisuralis* (Say) (Ariz., Sonora); *Silvius (Assipala) ceras* Townsend (N. Mex., and Chih. to Chis.); *Pilimas californica* (Bigot), *Chrysops coquilleti* Hine, and *C. noctifer* Osten Sacken (Calif., Baja Calif.), *C. facialis* Townsend (Ariz., N. Mex., Sonora), *C. pachycerus* Williston (Calif. to Utah, Baja Calif., Sonora) and var. *hungerfordi* Brennan (Ariz., N. Mex., Chih.), *C. virgulatus* Bellardi (Calif. to Tex., Sonora and Chih. to Jalisco), *C. wileyae* Philip (Oreg. and Utah to Calif., Baja Calif.); *Bolbodimyia atrata* (Hine) (Ariz., Sinaloa to Jalisco); *Stenotabanus flavidus* (Hine) (Ariz., Sonora), *S. guttatulus* (Townsend) (N. Mex., Utah, Chih.); *Leucotabanus ambiguus* Stone (Ariz., Guat.); *Tabanus dorsifer* Walk. (Ariz., Tex., Chih. to Nueva Leon and Chis.), *T. erythraeus* (Bigot) (Ariz., Chih. to Mor. and Vera Cruz), *T. gilanus* Townsend (Ariz. to Texas, Chih.), *T. laticeps* Hine (Pac. Coast to Baja Calif., courtesy of Dr. L. L. Pechuman), *T. morbosus* Stone (Ariz., Sonora), *T. punctifer* Osten Sacken (western U.S.A., Baja Calif. to Chih.), *T. subsimilis* Bellardi (Ariz. to eastern U.S.A., Chih. to northeastern and central Mex.) and ssp. *nippontucki* Philip (Calif. to Tex., Sonora and Chih. to Jalisco).

This limited total of 4 pangoniine species, 7 chrysopines, and 11 tabanines is nearly twice as great, however, as the combined totals to the east of 2 chrysopines and 6 tabanines found on both sides of the Texas-Mexican border, and of 1 chrysopine and 3 tabanines found both in southern Florida and the Neotropical Antilles. These totals of overlapping species are hardly significant in comparison to the remaining totals of 271 recognized Nearctic and 196 Mexican-Antillean species (excluding infraspecific forms).

Practically no tabanid species that are not rarities are known to be precinctive in the Sonoran and adjacent desert areas. One such, however, is *Chrysops latifrons* Brennan which is restricted to, but abundant in the Death Valley area in southern Nevada and southwestern California. Species that are customary inhabitants of the arid environments, such as *Esenbeckia delta* Hine, certain of the *pachycera* group of *Chrysops*, *Stenotabanus cribellum* (Townsend), and *Tabanus subsimilis* ssp. *nippontucki* Philip, are customarily more pallid than their congeners.

The *Ricardoa* group of the genus *Esenbeckia* is typically Mexican while only 3 of 27 species have crossed into U.S.A.

The remarkable genus *Apatolestes* has had a burst of speciation of 12 species in southern California and Baja California with extensions of 4 into Arizona and of one as far north as western Montana. Only 4 have crossed into northwestern Mexico. It is puzzling that certain obvious relatives occur in Chile but none are known in between.

Bolbodimyia atrata (Hine), a member of a genus elaborated in the Neotropics, has become isolated in famed Oak Creek Canyon, Arizona, where several females have been taken over the years. The male of this distinctive species was described from Jalisco, Mexico (Philip, 1954) and Dr. L. L. Pechuman has seen it from Durango and Sinaloa.

Silvius subgenus *Assipala* is represented by 4 species from Central America and Mexico. One of them, *S. ceras* Townsend, has moved northward into the Gila River drainage of New Mexico and it extends south as far as Chiapas. Other species restricted to the desert areas in southern Arizona and/or New Mexico, and adjoining northern states of Mexico are: *Apatolestes aitkeni* Philip, *C. facialis* Townsend, and *Stenotabanus flavidus* (Hine).

Reverse penetration from the north has undoubtedly occurred in the case of the large, aggressive *Tabanus punctifer* Osten Sacken which occurs not uncommonly from southwestern Canada throughout western U.S.A. A specimen has been taken as far south as the tip of Baja California at San Luis del Cabo; others in Sonora and Chihuahua. This species has a preference for breeding in brackish water; a female was identified by a farm laborer who killed it while biting him on the neck in salt flats near Battle Mountain, Nevada. He was later hospitalized with tularemia and a primary ulcer at the site of the bite.

"Deer fly fever," a form of tularemia, has been reported in several western states, and the usually associated vector, *Chrysops discalis* Will., is another brackish water breeder. No cases of this form of the disease have been reported from the actual Sonoran Desert Region (Jellison, 1950) nor are there other known disease agents transmitted by tabanids there. This is very probably because no suitable search has been made locally for pathogens in these bloodsucking flies. Tularemia (form unspecified) has been reported (unpublished) by American physicians in residents south of the border below Yuma, Arizona.

The genus *Hybomitra* has been an especially vigorous colonizer in temperate, boreal, and circumpolar regions of the northern hemisphere with southern extensions in North America along the principal mountain chains in eastern and western U.S.A. Early reports of 2 Nearctic species in mountainous areas of central Mexico have not since been confirmed, but subsequent description of 3 other species described only

from Mexico strongly suggests that such known "expansionists" among the group as *H. lasiophthalma* (Macquart) will eventually be found to have penetrated south along Mexico's western mountain chains.

In summary, while certain tabanid species are characteristically found in the Sonoran Desert and adjacent areas, present information is still inadequate for data on the Tabanidae to contribute significantly to the overall faunal picture.

LITERATURE CITED

- DICE, L. R. 1943. The biotic provinces of North America. Univ. Mich. Press, 78 pp.
- JELLISON, W. L. 1950. Tularemia: Geographical distribution of "deerfly fever" and the biting fly, *Chrysops discalis* Williston. Public Health Rep., 65: 1321-1329.
- OLDROYD, H. 1954. The horse-flies of the Ethiopian Region. Volume III. Subfamilies Chrysopinae, Sepsidinae and Pangoniinae and a revised classification. 489 pp.
- PHILIP, C. B. 1954. New North American Tabanidae (Diptera). Part V. A striking new *Bolbodimyia* from Mexico. Wasmann J. Biol., 12: 29-33.
1965. Family Tabanidae. In Stone, A., Sabrosky, C. W., Wirth, W. W., Foote, R. H., and Coulson, J. R. (eds.): A Catalog of the Diptera of America North of Mexico. U. S. Dep. Agr. Handb. No. 276, pp. 319-342.
- SHREVE, F. 1951. Vegetation of the Sonoran desert. Carnegie Inst. Wash., Publ. No. 591, 192 pp.
-

Obituary Notice

Howard Lester McKenzie, President-elect of the Society, died of cancer on 17 October 1968. Mr. McKenzie was internationally known for his systematic research on mealybugs. He was an Entomologist in the Department of Entomology, University of California, Davis.